

Core Requirements

Core Curriculum

The Core Curriculum at Mines forms the foundation for advanced study in the major fields. It is designed to give students the fundamental knowledge and skills they will need and put to use in their majors and in careers after graduation. Core courses provide students with fundamental technical, mathematical, and writing skills. In Core courses, students learn basic scientific procedures, principles, concepts, laws, and theories relevant to all applied sciences. In addition, Core courses in the humanities and social sciences help students develop interdisciplinary perspectives on the ethical, social, and cultural contexts within which engineering takes place.

The variety of courses in the Core Curriculum also provide students with opportunities to develop skills in problem solving, critical thinking, teamwork, design, and communication. Students who complete the Core are well prepared to be lifelong learners and leaders who can work effectively in an increasingly globalized world.

The Core Curriculum has three parts, the details of which can be found below. All CSM students complete the courses in the Common Core. Courses required in the Science Requirement and Engineering Requirement vary according to the major field of study. Finally, all students have a number of Free Elective courses. Free Electives are usually taken in the last two years.

Refer to the Degree Requirements section for each major program under Undergraduate Programs and Departments for a listing of Core courses students should take each semester.

Overview: Core Course Requirements

Core & distributed course requirements for Bachelor of Science degrees are comprised of the following four groups:

1. **Core Curriculum** - Students in all degree programs are required to complete all course requirements listed in this group.
2. **Humanities and Social Sciences Requirement** - Students in all degree programs are required to complete all course requirements listed in this group.
3. **Science Requirement** - Students in all degree programs are required to complete a minimum of three courses as prescribed by the specific degree program.
4. **Engineering Requirement** - Engineering Requirements are applicable to undergraduate students in engineering disciplines as specified by the degree program. See Department and Division program descriptions in this Catalog for specific courses required.

1) The Core Curriculum

Core requirements are applicable to all undergraduate students:

In Mathematics and the Basic Sciences

MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I	4.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II	4.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0
MATH225	DIFFERENTIAL EQUATIONS	3.0

CHGN121	PRINCIPLES OF CHEMISTRY I	4.0
PHGN100	PHYSICS I - MECHANICS	4.5
In Design		
EDNS151	DESIGN I	3.0
In Physical Activity (four separate semesters including the following)*		
PAGN Elective	PHYSICAL ACTIVITY COURSE	0.5
PAGN Elective	PHYSICAL ACTIVITY COURSE	0.5
PAGN Elective	PHYSICAL ACTIVITY COURSE	0.5
PAGN Elective	PHYSICAL ACTIVITY COURSE	0.5
In Freshman Orientation & Success		
CSM101	FRESHMAN SUCCESS SEMINAR	0.5
Free Electives**		
Minimum of 9.0 Semester Hours		9.0
Total Semester Hrs		38.0

* A minimum of 2.0 credit hours. See the Physical Education and Athletics section for specifics.

** A minimum of 9.0 hours of Free Elective are included with each degree-granting program.

1. The choice must not be in conflict with any Graduation Requirements (catalog.mines.edu/undergraduate/undergraduateinformation/undergraduatedegreerequirements).
2. Free electives to satisfy degree requirements may not exceed three semester hours (3.0) in activity courses such as band, choir, studio art, physical activity, and varsity athletics courses combined.
3. Transfer credits used for free electives must comply with the transfer credit guidelines.

2) Humanities and Social Science Requirement

HASS Requirements are applicable to all undergraduate students:

HASS100	NATURE AND HUMAN VALUES	4.0
HASS200	GLOBAL STUDIES	3.0
EBGN201	PRINCIPLES OF ECONOMICS	3.0
MID-LEVEL ELECTIVE	Two courses from the approved list of requirements*	6.0
400-LEVEL ELECTIVE	One course at the 400-level from the approved list of requirements*	3.0
Total Semester Hrs		19.0

* See the approved list in the Humanities, Arts, and Social Sciences section of this Catalog.

3) Distributed Science Requirement

The Science Requirement is a minimum of three courses and is applicable to all undergraduate students as follows:

APPLIED MATH & STATISTICS

MATH201	PROBABILITY AND STATISTICS FOR ENGINEERS
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CSCI101	INTRODUCTION TO COMPUTER SCIENCE or CBEN110 FUNDAMENTALS OF BIOLOGY I or CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)

	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
BIOCHEMISTRY	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
CBEN110	FUNDAMENTALS OF BIOLOGY I
CHEMISTRY - See degree specialty listings to determine if CBEN110 or GEGN101 are required	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
CBEN110	FUNDAMENTALS OF BIOLOGY I
	or GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS
CHEMICAL ENGINEERING	
CBEN110	FUNDAMENTALS OF BIOLOGY I
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
CHEMICAL & BIOCHEMICAL ENGINEERING	
CBEN110	FUNDAMENTALS OF BIOLOGY I
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
CIVIL ENGINEERING	
FOUR COURSES REQUIRED	
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
MATH201	PROBABILITY AND STATISTICS FOR ENGINEERS
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
GEGN101	EARTH AND ENVIRONMENTAL SYSTEMS
	or CBEN110 FUNDAMENTALS OF BIOLOGY I
COMPUTER SCIENCE	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CSCI101	INTRODUCTION TO COMPUTER SCIENCE
MATH201	PROBABILITY AND STATISTICS FOR ENGINEERS
ECONOMICS	
CSCI101	INTRODUCTION TO COMPUTER SCIENCE
MATH201	PROBABILITY AND STATISTICS FOR ENGINEERS
CBEN110	FUNDAMENTALS OF BIOLOGY I
	or GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS
	or PHGN200 PHYSICS II-ELECTROMAGNETISM AND OPTICS
	or CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)
	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
ELECTRICAL ENGINEERING	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHOOSE TWO FROM BELOW	
CBEN110	FUNDAMENTALS OF BIOLOGY I

GEGN101	EARTH AND ENVIRONMENTAL SYSTEMS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
CSCI101	INTRODUCTION TO COMPUTER SCIENCE
ENGINEERING	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CSCI101	INTRODUCTION TO COMPUTER SCIENCE
	or MATH201 PROBABILITY AND STATISTICS FOR ENGINEERS
MATH201	PROBABILITY AND STATISTICS FOR ENGINEERS
	or CBEN110 FUNDAMENTALS OF BIOLOGY I
	or CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)
	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
	or CSCI101 INTRODUCTION TO COMPUTER SCIENCE
	or GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS
ENVIRONMENTAL ENGINEERING	
FOUR COURSES REQUIRED	
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
GEGN101	EARTH AND ENVIRONMENTAL SYSTEMS
MATH201	PROBABILITY AND STATISTICS FOR ENGINEERS
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
GEOLOGICAL ENGINEERING	
GEGN101	EARTH AND ENVIRONMENTAL SYSTEMS
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
GEOPHYSICAL ENGINEERING	
GEGN101	EARTH AND ENVIRONMENTAL SYSTEMS
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CBEN110	FUNDAMENTALS OF BIOLOGY I
	or CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)
	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
	or CSCI101 INTRODUCTION TO COMPUTER SCIENCE
	or MATH201 PROBABILITY AND STATISTICS FOR ENGINEERS
MECHANICAL ENGINEERING	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)
	or CHGN125 MOLECULAR ENGINEERING & MATERIALS CHEMISTRY
CBEN110	FUNDAMENTALS OF BIOLOGY I
	or GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS
METALLURGICAL & MATERIALS ENGINEERING	
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS

CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)
or CHGN125 MOLECULAR ENGINEERING & MATERIALS
CHEMISTRY

CBEN110 FUNDAMENTALS OF BIOLOGY I
or GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS

MINING ENGINEERING

GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS

PHGN200 PHYSICS II-ELECTROMAGNETISM AND
OPTICS

CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)

PETROLEUM ENGINEERING

GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS

PHGN200 PHYSICS II-ELECTROMAGNETISM AND
OPTICS

CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)
or CHGN125 MOLECULAR ENGINEERING & MATERIALS
CHEMISTRY

ENGINEERING PHYSICS

PHGN200 PHYSICS II-ELECTROMAGNETISM AND
OPTICS

CHGN122 PRINCIPLES OF CHEMISTRY II (SC1)
or CHGN125 MOLECULAR ENGINEERING & MATERIALS
CHEMISTRY

CBEN110 FUNDAMENTALS OF BIOLOGY I
or GEGN101 EARTH AND ENVIRONMENTAL SYSTEMS
or CSCI101 INTRODUCTION TO COMPUTER SCIENCE

PAGN PHYSICAL ACTIVITY ELECTIVE 0.5
Elective

16.0

Total Semester Hrs: 32.0

* For scheduling purposes, registration in combinations of GEGN101, CBEN110, HASS100, EBGN201, MATH201, CSCI101, and EDNS151 will vary between the fall and spring semesters. Students admitted with acceptable advanced placement credits will be registered in accordance with their advanced placement status.

** Completion of EDNS155 in lieu of EDNS151 is by permission only and does not alter the total hours required for completion of the degree.

4) Engineering Requirement (see degree program listing)

Engineering Requirements are applicable to undergraduate students in engineering disciplines as specified by the degree program. See Department and Division program descriptions in this Catalog for specific courses required.

The Freshman Year

Freshmen in all programs normally take similar subjects. A sample first year schedule is listed below:

Freshman

Fall	lec	lab	em.hrs
CHGN121 PRINCIPLES OF CHEMISTRY I			4.0
MATH111 CALCULUS FOR SCIENTISTS AND ENGINEERS I			4.0
EBGN201 PRINCIPLES OF ECONOMICS*			3.0
HASS100 NATURE AND HUMAN VALUES			4.0
CSM101 FRESHMAN SUCCESS SEMINAR			0.5
PAGN PHYSICAL ACTIVITY ELECTIVE			0.5
Elective			
			16.0

Spring	lec	lab	em.hrs
MATH112 CALCULUS FOR SCIENTISTS AND ENGINEERS II			4.0
EDNS151 DESIGN I**			3.0
PHGN100 PHYSICS I - MECHANICS			4.5
DIST SCI Distributed Science Requirement*			4.0